AMENDMENTS TO THE CLAIMS

Claims 1-35. (cancelled)

36.(previously presented): Receiving apparatus, for receiving a transmission signal in a cellular mobile communications system, comprising:

a main beamformer which processes received signals, representing said transmission signal, in accordance with a main beam pattern that is determined by beam control information applied thereto, said main beam pattern being adjusted as necessary during use of the receiving apparatus to facilitate reception of said transmission signal;

an assistant beamformer which, in an initial operating phase of the apparatus, processes such received signals in accordance with each one of a plurality of different assistant beam patterns to derive one or more output signals corresponding to the assistant beam pattern concerned, each such pattern being determined by beam control information corresponding individually thereto; and

a beam control information setting unit which employs said output signals and said beam control information corresponding respectively to said assistant beam patterns to make an initial estimate of said beam control information for said main beamformer.

37.(previously presented): Receiving apparatus as claimed in claim 36, wherein said assistant beamformer has a plurality of individual assistant beamformer units that are operable simultaneously to process said received signals in accordance with different respective ones of said assistant beam patterns.

38.(previously presented): Receiving apparatus as claimed in claim 37, further comprising a plurality of buffers, each having an input connected for receiving a corresponding one of said received signals and an output connected to an input of said main beamformer, for applying the received signals to the main beamformer a predetermined delay period after those signals are applied to the assistant beamformer.

39.(previously presented): Receiving apparatus as claimed in claim 36, wherein said assistant beamformer has a single beamformer unit operable to process the received signals in accordance with each of said assistant beam patterns in a predetermined sequence, the apparatus further comprising an output signal storage unit for storing, for each assistant beam pattern of said sequence, one or more samples of said one or more output signals produced by said single beamformer unit.

40.(previously presented): Receiving apparatus as claimed in claim 39, wherein said single beamformer unit is also employed by the said main beamformer, after said initial operating phase, to process said received signals in accordance with said main beam pattern.

41.(previously presented): Receiving apparatus as claimed in claim 39, further comprising a beam control information storing unit for storing said beam control information corresponding to each assistant beam pattern and for applying to the single beamformer unit the stored beam control information corresponding to each in turn of said assistant beam patterns.

42.(previously presented): Receiving apparatus as claimed in claim 41, wherein the beam control information storing unit comprises a cyclic shift register.

43.(previously presented): Receiving apparatus as claimed in claim 39, wherein at least two samples of said output signal are stored for each assistant beam pattern, the apparatus further comprising an averaging unit for averaging the stored output-signal samples for each assistant beam pattern.

44.(currently amended): Receiving apparatus as claimed in claim 39, further comprising a buffer corresponding to each said received signal, [[the]] said buffer being operable to apply the same received signals, representing a predetermined portion of the transmission signal, a plurality of times in succession to said single beamformer unit, the assistant beamformer being operable to process the received signals applied thereto in accordance with a different one of said assistant beam patterns at each of said times.

45.(previously presented): Receiving apparatus as claimed in claim 44, wherein said buffer is also operable to apply the same received signals to said single beamformer unit once again following said plurality of times, thereby to enable said main beamformer to process those received signals in accordance with said main beam pattern.

46.(previously presented): Receiving apparatus as claimed in claim 44, wherein said buffer comprises a switch having a first set of inputs corresponding respectively to said assistant

beam patterns, the inputs of the first set being connected one to the next by respective buffer elements, and also having an output connected to an input of said single beamformer unit.

47.(previously presented): Receiving apparatus as claimed in claim 45, wherein:

said buffer comprises a switch having a first set of inputs corresponding respectively to said assistant beam patterns, the inputs of the fast set being connected one to the next by respective buffer elements, and also having an output connected to an input of said single beamformer unit; and said switch has a further input corresponding to said main beam pattern, which further input is connected to the last input of said first set by a further such buffer element of the said buffer.

48.(previously presented): Receiving apparatus as claimed in claim 36, wherein said assistant beamformer includes a path searcher which, during processing of the received signals in accordance with each different assistant beam pattern, identifies a plurality of best paths for the assistant beam pattern concerned.

49.(previously presented): Receiving apparatus as claimed in claim 48, wherein said assistant beamformer derives such an output signal per best path identified by the said path searcher.

50.(previously presented): Receiving apparatus as claimed in claim 48, wherein said assistant beamformer further includes a RAKE combiner which combines signals corresponding

to the identified best paths, and the assistant beamformer derives one such output signal representing those combined signals.

51.(previously presented): Receiving apparatus as claimed in claim 36, comprising a plurality of RAKE fingers, each including such a main beamformer, and said beam control information setting unit makes such an initial estimate of the beam control information for the main beamformer in each such RAKE finger.

52.(previously presented): Receiving apparatus as claimed in claim 51, wherein the initial estimates for at least two of the RAKE fingers of said plurality can be different from one another.

53.(previously presented): Receiving apparatus as claimed in claim 36, wherein the beam control information setting unit compares one or more predetermined characteristics of said output signals corresponding to said different assistant beam patterns to identify one or more best assistant beam patterns.

54.(previously presented): Receiving apparatus as claimed in claim 53, wherein said predetermined characteristics include one or more of the following: a carrier-interference ratio, a signal-noise and interference ratio, a bit error rate, and a signal strength.

55.(previously presented): Receiving apparatus as claimed in claim 54, wherein, if comparison of the output signals in respect of a first one of said predetermined characteristics is

inconclusive in identifying the said one or more best patterns, said beam control information setting unit compares the output signals in respect of a second one of the predetermined characteristics different from the said first predetermined characteristic.

56.(previously presented): Receiving apparatus as claimed in claim 53, wherein, when one best assistant beam pattern is identified, said beam control information setting unit makes said initial estimate the same as the beam control information corresponding that one identified assistant beam pattern.

57.(previously presented): Receiving apparatus as claimed in claim 53, wherein the beam control information unit includes an interpolator which, when two or more best assistant beam patterns are identified, determines said initial estimate by interpolating from the beam control information corresponding to the identified assistant beam patterns.

58.(previously added) Receiving apparatus as claimed in claim 57, wherein in such interpolation the identified assistant beam patterns are weighted according to one of said predetermined characteristics.

59.(previously presented): Receiving apparatus as claimed in claim 53, wherein, when two or more best assistant beam patterns are identified, the beam information control unit uses the beam control information for each identified best pattern to provide said initial estimate for at least one RAKE finger of said plurality.

60.(previously presented): Receiving apparatus as claimed in claim 36, wherein said transmission signal is a CDMA signal.

61.(previously added): Received apparatus as claimed in claim 36, wherein said transmission signal is a TDMA signal.

62.(previously presented): Receiving apparatus as claimed in claim 36, wherein said received signals are digital signals and said main and assistant beamformers are digital beamformers.

63.(currently amended): Receiving apparatus as claimed in ~~any preceding~~ claim 36, wherein said assistant beamformer processes those portions of the received signals that represent pilot symbols included in the transmission signal.

64.(currently amended): Receiving apparatus as claimed in ~~any preceding~~ claim 36, wherein said received signals are derived from different respective antenna elements.

65.(previously presented): Receiving apparatus as claimed in claim 64, wherein the number of different assistant beam patterns of said plurality is greater than the number of antenna elements.

66.(previously presented): Receiving apparatus as claimed in claim 64, wherein said antenna elements are spaced non-uniformly one from the next.

67.(previously presented): Receiving apparatus as claimed in claim 64, wherein at least two of said antenna elements are arranged in different planes.

68.(previously presented): Receiving apparatus as claimed in claim 36, wherein said beam control information corresponding individually to each assistant beam pattern serves to control one or more of the following characteristics of the assistant beam pattern concerned: the pointing directions, shape and width of the beans embodied in the beam pattern.

69.(previously presented): Receiving apparatus as claimed in claim 68, wherein at least one of said beam pattern characteristics is different in at least two of said assistant beam patterns.

70.(previously presented): A method of receiving a transmission signal in a cellular mobile communications system, in which received signals representing said transmission signal are processed in accordance with a main beam pattern that is determined by beam control information corresponding thereto, and the main beam pattern is adjusted as necessary to facilitate reception of said transmission signal;

the method including an initialisation step of: processing such received signals in accordance with each one of a plurality of different assistant beam patterns to derive one or more output signals corresponding to the assistant beam pattern concerned, each such pattern being determined by beam control information corresponding individually thereto; and

employing said output signals and said beam control information corresponding respectively to said assistant beam patterns to make an initial estimate of said beam control information corresponding to said main beam pattern.

71.(previously presented): Receiving apparatus, for receiving a transmission signal in a cellular mobile communications system, comprising:

main beamformer means operable to process received signals, representing said transmission signal, in accordance with a main beam pattern that is determined by beam control information applied thereto, said main beam pattern being adjusted as necessary during use of the receiving apparatus to facilitate reception of said transmission signal;

assistant beamformer means operable, in an initial operating phase of the apparatus, to process such received signals in accordance with each one of a plurality of different assistant beam patterns to derive one or more output signals corresponding to the assistant beam pattern concerned, each such pattern being determined by beam control information corresponding individually thereto; and

beam control information setting means operable to employ the said output signals and said beam control information corresponding respectively to said assistant beam patterns to make an initial estimate of said beam control information for said main beamformer means.